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MEMORANDUM

TO: FILE

FROM: Jerry Jackson

DATE: July 17, 1992

SUBJECT: April 24, 1992 MIT Inspection at Moab Salt, Inc. (Injection Well No. 15/ Permit No. UTU300001)

Background

On March 27, 1992 Moab Salt, Inc. determined that Injection Well No. 15 had lost mechanical integrity. An investigation had been initiated on March 18, 1992 when it was noted that the injection/extraction ratio exceeded 1.04 for two consecutive weeks (1.476 and 1.183). A workover drill rig started an examination of the well on March 25, 1992. On March 27, 1992 a hole in the 7-inch casing was located 619 feet below the surface, indicating failure of mechanical integrity.

There is no USDW in the area of review and no indication of where the lost brine went. Subsequent tests of Colorado River water downstream of the plant site do not show elevated total dissolved solids relative to upstream samples.

The 7" well tubing was scraped clean down to 2156' and the bore flushed with Colorado River water (Sp. Cond. ≈ 1444 µmhos) to the bottom of the casing at 3028'. Several sections of the 7 " tubing were subsequently perforated, cemented and drilled out during efforts to seal the leak. After many attempts to cement the annulus between the 7" tubing and the 9" well casing, there remained a section between 300' and ≈ 2140' with cement but no apparent bonding (except for a region about 50' above and below the 619' leak that has no apparent cement).

All cementing efforts to seal the leak failed. A decision was made to install a mild steel tubing patch (≈ 1/8" wall thickness) to the well tubing. The patch was installed on April 23, 1992 utilizing an expansion tool.

Mechanical Integrity Test

Jerry Jackson (DWQ) arrived at Moab Salt about 11:00 a.m. on April 24, 1992. Accompanied Rick York (Plant Manager) to site of Injection Well No. 15. A work-over drill rig was in position over the well-head and surrounded by evidence of a major work-over.

Buddy Beene of Well Analysis Co. (Farmington, New Mexico) was contracted by Moab Salt, Inc. to run a radioactive iodine tracer test on Well No. 15 to determine mechanical integrity following

the patch job noted above. The casing was again flushed with Colorado River water and the radioactive tracer survey was run using guidelines provided by DWQ with minor variations. Witnesses included Mr. Jackson and Mr. York. Prior to the injection of the radioactive iodine Mr. Jackson requested that the well-head pressure gauge be changed from one reading 0-800 psi to one reading a maximum pressure closer to maximum operating pressure of the injection well (80 psi). Another pressure gauge reading 0-100 psi was installed in response to this request.

The radioactive iodine tracer was pushed down the well using 20° C Colorado River water at Sp. Cond. ≈ 1444 µmhos and an initial injection pressure of 90 psi. Normal operating pressure of the injection well is between 50 and 60 psi. The injection pressure stayed between 80 and 90 psi for most of the test, gradually declining to 55 psi even though the pumping rate was constant, and gauge pressure did not decline when the pump was shut off during logging. The reasons for these observations may be related to the variation in density between the injected river water and the much denser brine in the mine. The pressure gauge was later tested for accuracy by Moab Salt and found to be correct.

The logging speed did not exceed 60 ft/minute. The volume of river water injected during the test was approximately 99 barrels.

Observations made during the MIT and by the well logger's final report indicate that Well No. 15 has no significant leak in the casing, tubing or packer and no significant fluid movement into an USDW through vertical channels adjacent to the injection well bore.

Mr. Jackson left the site at approximately 5:30 p.m.

cc: E. K. York, Manager, Moab Salt, Inc.
Dan Jackson, EPA Region VIII
Dave Ariotti
Southeastern Utah District Health Dept.
Utah Division of Oil, Gas and Mining

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